

Serial No.: 10/804,841
Attorney Docket No.: 461987-024
RESPONSE

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) A plating cell comprising:
 - a workpiece holder,
 - an anode,
 - a plurality of eductors for directing an electrolyte solution into the plating cell, and
 - a solution flow dampening member,

wherein the eductors, the dampening member and the workpiece are arranged such that electrolyte solution ejected from the eductors is directed by the dampening member to flow across the surface of the workpiece.
2. (Withdrawn) The plating cell of claim 1, wherein the workpiece is selected from the group consisting of a printed circuit board, printed wiring board, high density interconnect printed circuit board, high density interconnect printed wiring board, wafer level package, and chip scale package.
3. (Withdrawn) The plating cell of claim 1, further comprising a vibrator for the workpiece.
4. (Withdrawn) The plating cell of claim 3, further comprising an oscillator for the workpiece.
5. (Withdrawn) The plating cell of claim 1, further comprising an oscillator for the workpiece.

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6. (Withdrawn) The plating cell of claim 1, wherein the electrolyte solution contains metal ions selected from the group consisting of copper ions, gold ions, nickel ions, tin ions, and the metal ions derived from lead-tin solder.
7. (Withdrawn) The plating cell of claim 1, wherein the distance between the anode and the workpiece is about 165 to about 300 mm.
8. (Withdrawn) The plating cell of claim 7, wherein the distance between the anode and the workpiece is about 210 to about 250 mm.
9. (Withdrawn) The plating cell of claim 8, wherein the distance between the anode and the workpiece is about 210 to about 220 mm.
10. (Withdrawn) The plating cell of claim 1, wherein the dimensions of the workpiece range from about 150 mm by about 150 mm to about 5 meters by about 5 meters.
11. (Withdrawn) The plating cell of claim 1, wherein the dimensions of the workpiece are about 200 mm to about 300 mm diameter.
12. (Cancelled).
13. (Withdrawn) The plating cell of claim 1 wherein the shaped guide is a member having a curved surface.
14. (Withdrawn) The plating cell of claim 13 wherein the shaped guide has a radius of curvature of about 6 to 12 inches.
15. (Withdrawn) The plating cell of claim 1 wherein the shaped guide is a member having an inclined planar surface.
16. (Withdrawn) The plating cell of claim 1, wherein the anode is housed in an anode chamber and the anode chamber contains a porous cloth.
17. (Withdrawn) The plating cell of claim 16, wherein the porous cloth interposed between the anode and the workpiece such that the ionic current flow between the anode and the workpiece passes through the porous fiber cloth.

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18. (Withdrawn) The plating cell of claim 16, wherein the anode chamber contains a baffle.
19. (Withdrawn) The plating cell of claim 16, wherein the anode chamber contains a non-conducting shield.
20. (Withdrawn) The plating cell of claim 16, wherein the anode chamber contains a non-conducting shield.
21. (Currently Amended) A method for electrodepositing a metal on a workpiece having a generally flat vertically oriented major surface, the workpiece serving as a cathode in a plating cell, the plating cell containing an anode that is housed in an anode chamber of a size greater than the workpiece including a flat porous cloth oriented in a planar parallel relationship to the major surface of the workpiece that spreads the current distribution between the anodes and the workpiece such that the anode chamber acts as a virtual anode, a horizontally directed, -an eductor, a solution flow dampening member coextensive with the anode chamber including a flow-directing surface longer than the workpiece and an electrolyte solution, the electrolyte solution containing metal ions, comprising the steps of:

passing the electrolyte solution from an eductor over the flow-directing surface of a solution flow dampening member to produce a vertical solution flow that is uniform, parallel to and between the major surface of the workpiece and the parallel porous cloth of the anode chamber, and

passing an electric current between the anode and the cathode whereby the metal ions in the electrolyte solution are deposited on the workpiece.

22. (Original) The method of claim 21, wherein the workpiece is selected from the group consisting of a printed circuit board, printed wiring board, high density interconnect printed circuit board, high density interconnect printed wiring board, wafer level package, and chip scale package.
23. (Original) The method of claim 21, wherein the cell includes a vibrator for the workpiece.

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24. (Original) The method of claim 23, wherein the cell includes an oscillator for the workpiece.
25. (Original) The method of claim 21, wherein the cell includes an oscillator for the workpiece.
26. (Original) The method of claim 21, wherein the metal ions are selected from the group consisting of copper ions, gold ions, nickel ions, tin ions, and the metal ions derived from lead-tin solder.
27. (Original) The method of claim 21, wherein the distance between the anode and the workpiece is about 165 to about 300 mm.
28. (Original) The method of claim 27, wherein the distance between the anode and the workpiece is about 210 to about 250 mm.
29. (Original) The method of claim 28, wherein the distance between the anode and the workpiece is about 210 to about 220 mm.
30. (Original) The method of claim 29, wherein the dimensions of the workpiece range from about 150 mm by about 150 mm to about 5 meters by about 5 meters.
31. (Original) The method of claim 30, wherein the dimensions of the workpiece are about 200 mm to about 300 mm diameter.
32. (Cancelled).
33. (Previously Presented) The method of claim 21 wherein the flow-directing surface is a curved surface.
34. (Previously Presented) The method of claim 33 wherein the curved surface has a radius of curvature of about 6 to 12 inches.
35. (Previously Presented) The method of claim 21 wherein the flow-directing surface is a flat surface.
36. (Cancelled).

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37. (Cancelled).
38. (Previously Presented) The method of claim 21, wherein the anode chamber contains a baffle underlying the chamber that cooperates with the dampening member to direct the electrolyte flow between the workpiece and the anode cloth.
39. (Original) The method of claim 38, wherein the anode chamber contains a non-conducting shield.
40. (Previously Presented) The method of claim 21, wherein the anode chamber contains a non-conducting shield.
41. (Withdrawn) The plating cell of claim 1, wherein the cell provides metal deposition across the workpiece having a coefficient of variability less than about 10%.
42. (Withdrawn) The plating cell of claim 41, wherein the coefficient of variability is less than about 7%.
43. (Withdrawn) The method of claim 42, wherein the coefficient of variability is less than about 5%.
44. (Previously Presented) The method of claim 21, wherein the metal deposition across the workpiece has a coefficient of variability in thickness less than about 10%.
45. (Original) The method of claim 44, wherein the coefficient of variability is less than about 7%.
46. (Original) The method of claim 45, wherein the coefficient of variability is less than about 5%.
47. (Cancelled).
48. (Currently Amended) The method of claim 47 21 wherein the cell is designed such that the electrolyte solution flows past the workpiece a single time before exiting the cell and being reintroduced to the cell through the eductors.